

Title (en)  
APPARATUS FOR ACCELERATING SIMULTANEOUS LOCALIZATION AND MAPPING AND ELECTRONIC DEVICE INCLUDING THE SAME

Title (de)  
VORRICHTUNG ZUR BESCHLEUNIGUNG DER GLEICHZEITIGEN LOKALISIERUNG UND KARTIERUNG UND ELEKTRONISCHE VORRICHTUNG DAMIT

Title (fr)  
APPAREIL POUR ACCÉLÉRER LA LOCALISATION ET LA CARTOGRAPHIE SIMULTANÉES ET DISPOSITIF ÉLECTRONIQUE LE COMPRENANT

Publication  
**EP 4174777 A1 20230503 (EN)**

Application  
**EP 22202788 A 20221020**

Priority  
KR 20210149020 A 20211102

Abstract (en)  
An apparatus for accelerating simultaneous localization and mapping (SLAM) includes a SLAM processor including a front-end processor and a back-end processor. The front-end processor is configured to track a position of a first feature, among features extracted from a first frame, in a second frame subsequent to the first frame, and the back-end processor is configured to obtain a first measurement regarding a map point and a camera pose of the first feature based on the position of the first feature in the second frame tracked by the front-end processor, compute elements affecting an optimization matrix in relation to the first measurement, among elements of a Hessian matrix regarding the map point and the camera pose, and accumulate the computed elements in the optimization matrix used to perform an optimization operation with respect to states of the map point and the camera pose.

IPC 8 full level  
**G06T 7/73** (2017.01); **G06T 7/246** (2017.01)

CPC (source: CN EP KR US)  
**G01C 11/00** (2013.01 - CN); **G01C 21/1656** (2020.08 - CN KR); **G01C 21/3647** (2013.01 - KR); **G01C 21/3804** (2020.08 - KR); **G01C 21/3841** (2020.08 - CN); **G06F 16/51** (2018.12 - KR); **G06T 1/20** (2013.01 - KR); **G06T 7/246** (2016.12 - EP); **G06T 7/73** (2016.12 - EP US); **G06T 19/006** (2013.01 - US); **G06T 2207/10016** (2013.01 - EP); **G06T 2207/30241** (2013.01 - EP); **G06T 2207/30244** (2013.01 - EP)

Citation (search report)  
• [X] RUCKERT DARIUS ET AL: "Snake-SLAM: Efficient Global Visual Inertial SLAM using Decoupled Nonlinear Optimization", 2021 INTERNATIONAL CONFERENCE ON UNMANNED AIRCRAFT SYSTEMS (ICUAS), IEEE, 15 June 2021 (2021-06-15), pages 219 - 228, XP033942469, DOI: 10.1109/ICUAS51884.2021.9476760  
• [A] YOUYANG FENG ET AL: "Incremental 3-D pose graph optimization for SLAM algorithm without marginalization", INTERNATIONAL JOURNAL OF ADVANCED ROBOTIC SYSTEMS, vol. 17, no. 3, 1 May 2020 (2020-05-01), CR, XP055930794, ISSN: 1729-8814, Retrieved from the Internet <URL:http://journals.sagepub.com/doi/full-xml/10.1177/1729881420925304> DOI: 10.1177/1729881420925304  
• [X] RÜCKERT D ET AL: "An Efficient Solution to Structured Optimization Problems using Recursive Matrices", COMPUTER GRAPHICS FORUM : JOURNAL OF THE EUROPEAN ASSOCIATION FOR COMPUTER GRAPHICS, WILEY-BLACKWELL, OXFORD, vol. 38, no. 8, 14 November 2019 (2019-11-14), pages 33 - 39, XP071489807, ISSN: 0167-7055, DOI: 10.1111/CGF.13758

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)  
BA

Designated validation state (EPC)  
KH MA MD TN

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DOCDB simple family (application)  
**EP 22202788 A 20221020**; CN 202211103849 A 20220909; JP 2022169969 A 20221024; KR 20210149020 A 20211102; US 202217868453 A 20220719